Serology Antibody Testing vs Fingerstick Antibody Testing

What is the difference between the serology antibody test and a fingerstick antibody test?

The fingerstick antibody test is typically a qualitative, lateral flow assay and can be used as a point-of-care test. These are often like pregnancy tests, in that the test shows the user colored lines to indicate positive or negative results. Depending on the test itself, the total test time is typically anywhere from 15 minutes to an hour. These tests detect human antibodies (IgG, IgM) or viral antigens.

The serology antibody test is generally a lab-based test and can be either qualitative or quantitative. These tests typically use whole blood, plasma, or serum samples from patients. Plates that are coated with a viral protein of interest, such as a spike protein, are essential for these tests. Patient sample are then incubated with the protein, and if the patient has antibodies to the viral protein they bind together. The bound antibody-protein complex can then be detected with another wash of antibodies that produce a color or fluorescent-based readout. These tests also detect human antibodies to SARS-CoV-2 (IgG, IgM, IgA).

Is one preferred over the other and if so, why?

Although the fingerstick antibody test is typically a point-of-care test and does not require as much lab equipment, it cannot tell the quantifiable amount of antibodies in the patient serum. Most of these tests distinguish between the type of antibody that is present (IgG, IgM, or IgA) and do not detect total antibody.

The enzyme immunoassay (EIA) is ideal for high volume labs, since one plate can run up to 94 patient specimens at a time. ***This assay was built with the focus on higher specificity while not sacrificing on the sensitivity side***. Our EIA is also a total antibody test- so it detects all subclasses of immunoglobulin and no differentiation is possible between isotypes. *The CDC is now recommending the total antibody design for COVID-19 serology tests, as it seems to deliver the highest sensitivity (https://www.cdc.gov/coronavirus/2019-ncov/lab/testing-laboratories.html – under the "Should I test for IgG or IgM?" question).*

Are there any false positive results?

A high number of false positives are not expected, but as a new test it is hard to quantify its performance.

Performance to-date:

Sensitivity – 91% (95% CI: 82, 97)
Specificity – 100% (95% CI: 99, 100)
Positive Predictive Value (PPV) – 100% (95% CI: 94, 100)
Negative Predictive Value (NPV) – 98% (95% CI: 96, 99)
Accuracy – 98% (95% CI: 96, 99)
Speaking to our specificity, we also tested 1011 randomly selected serum samples (collected 4/2 – 4/9) from blood donors across the state of Oklahoma. The seroprevalence of SARS-CoV-2 for Oklahoma was 1.4% (95% CI: 0.76% to 2.31%). Therefore, even if we suspected that all positives were false positives, the lower bound of our specificity would be around 98.6%.

To assess cross-reactivity concerns, we were able to test a panel of samples that included ANA, HCV, RSV, CMV, Coronavirus OC43, and Coronavirus NL63. Our assay did not pick up any of these specimens.